

LONG BRANCH PUBLIC SCHOOLS

Physics Pacing Guide

Marking Period 1					ELA Common Core Standards						
Day	Unit	Topic	Desired Outcome	NGSS	Reading	Writing	S & L	Math	21st Century	Technology	
Opening Day 1			Rules, Procedures, Syllabus,								
Opening Day 2			Pre-Test (Benchmark 1), Safety								
1	Unit 1	One Dimensional Motion	Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force.]	HS-PS2-1	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2	
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9	Summative Assessment										
10	Lab Report and RST										
11	Unit 2	Two Dimensional Motion	Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force.]	HS-PS2-1	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2	
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19	Summative Assessment										
20	Lab Report and RST										
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Marking Period 2			ELA Common Core Standards							
Day	Unit		Desired Outcome	NGSS	Reading	Writing	S & L	Math	21st Century	Technology
1	Unit 3	Forces	Analyze data to support the claim that Newton’s second law of motion describes the mathematical relationship among the net force on a macroscopic object, its mass, and its acceleration. [Clarification Statement: Examples of data could include tables or graphs of position or velocity as a function of time for objects subject to a net unbalanced force, such as a falling object, an object rolling down a ramp, or a moving object being pulled by a constant force.]	HS-PS2-1	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2
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9	Summative Assessment									
10	Lab Report and RST									
11	Unit 4	Circular Motion	Use mathematical representations of Newton’s Law of Gravitation and Coulomb’s Law to describe and predict the gravitational and electrostatic forces between objects. [Clarification Statement: Emphasis is on both quantitative and conceptual descriptions of gravitational and electric fields.]	HS-PS2-4	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2
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19	Summative Assessment									
20	Lab Report and RST									
21	Midterms									
22	Midterms									

Marking Period 3				ELA Common Core Standards											
Day	Unit		Desired Outcome	NGSS	Reading	Writing	S & L	Math	21st Century	Technology					
1	Unit 5	Work, Energy and Power	Create a computational model to calculate the change in the energy of one component in a system when the change in energy of the other component(s) and energy flows in and out of the system are known. [Clarification Statement: Emphasis is on explaining the meaning of mathematical expressions used in the model.]	HS-PS3-1	RST.11-12.1	WHST.9-12.1 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2					
2			Develop and use models to illustrate that energy at the macroscopic scale can be accounted for as a combination of energy associated with the motions of particles (objects) and energy associated with the relative position of particles (objects). [Clarification Statement: Examples of phenomena at the macroscopic scale could include the conversion of kinetic energy to thermal energy, the energy stored due to position of an object above the earth, and the energy stored between two electrically-charged plates. Examples of models could include diagrams, drawings, descriptions, and computer simulations.]	HS-PS3-2	RST.11-12.1	WHST.9-12.1 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2					
3			Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.* [Clarification Statement: Emphasis is on both qualitative and quantitative evaluations of devices. Examples of devices could include Rube Goldberg devices, wind turbines, solar cells, solar ovens, and generators. Examples of constraints could include use of renewable energy forms and efficiency.]	HS-PS3-3	RST.11-12.1	WHST.9-12.1 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2					
4			Plan and conduct an investigation to provide evidence that the transfer of thermal energy when two components of different temperature are combined within a closed system results in a more uniform energy distribution among the components in the system (second law of thermodynamics). [Clarification Statement: Emphasis is on analyzing data from student investigations and using mathematical thinking to describe the energy changes both quantitatively and conceptually. Examples of investigations could include mixing liquids at different initial temperatures or adding objects at different temperatures to water.]	HS-PS3-4	RST.11-12.1	WHST.9-12.1 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2					
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7	Summative Assessment														
	Lab Report and RST														
8	Unit 6	Impulse and Momentum	Use mathematical representations to support the claim that the total momentum of a system of objects is conserved when there is no net force on the system. [Clarification Statement: Emphasis is on the quantitative conservation of momentum in interactions and the qualitative meaning of this principle.]	HS-PS2-2	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2					
9			Apply scientific and engineering ideas to design, evaluate, and refine a device that minimizes the force on a macroscopic object during a collision.* [Clarification Statement: Examples of evaluation and refinement could include determining the success of the device at protecting an object from damage and modifying the design to improve it. Examples of a device could include a football helmet or a parachute.]												
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16	Summative Assessment														
17	Lab Report and RST														
18	Unit 7	Harmonic Motion	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media. [Clarification Statement: Examples of data could include electromagnetic radiation traveling in a vacuum and glass, sound waves traveling through air and water, and seismic waves traveling through the Earth.]	HS-PS4-1	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2					
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21	Various State Testing on Various Day in Marking Period 3														
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Marking Period 4				ELA Common Core Standards										
Day	Unit		Desired Outcome	NGSS	Reading	Writing	Speaking and Listening	Math	21st Century	Technology				
1	Unit 7	Harmonic Motion	Evaluate the claims, evidence, and reasoning behind the idea that electromagnetic radiation can be described either by a wave model or a particle model, and that for some situations one model is more useful than the other. [Clarification Statement: Emphasis is on how the experimental evidence supports the claim and how a theory is generally modified in light of new evidence. Examples of a phenomenon could include resonance, interference, diffraction, and photoelectric effect.]	HS-PS4-3	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2				
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3			Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. [Clarification Statement: Emphasis is on the idea that photons associated with different frequencies of light have different energies, and the damage to living tissue from electromagnetic radiation depends on the energy of the radiation. Examples of published materials could include trade books, magazines, web resources, videos, and other passages that may reflect bias.]	HS-PS4-4	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2				
4			Communicate technical information about how some technological devices use the principles of wave behavior and wave interactions with matter to transmit and capture information and energy.* [Clarification Statement: Examples could include solar cells capturing light and converting it to electricity; medical imaging; and communications technology.]	HS-PS4-5	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2				
5			Summative Assessment											
6			Lab Report and RST											
7	Unit 8	Geometric Optics	Evaluate questions about the advantages of using a digital transmission and storage of information. [Clarification Statement: Examples of advantages could include that digital information is stable because it can be stored reliably in computer memory, transferred easily, and copied and shared rapidly. Disadvantages could include issues of easy deletion, security, and theft.]	HS-PS4-2	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2				
8														
9			Evaluate the validity and reliability of claims in published materials of the effects that different frequencies of electromagnetic radiation have when absorbed by matter. [Clarification Statement: Emphasis is on the idea that photons associated with different frequencies of light have different energies, and the damage to living tissue from electromagnetic radiation depends on the energy of the radiation. Examples of published materials could include trade books, magazines, web resources, videos, and other passages that may reflect bias.]	HS-PS4-4	RST.9-10.8 RST.11-12.1 RST.11-12.7 RST.11-12.8	WHST.9-12.2 WHST.11-12.8	SL.11-12.5	MP.2 MP.4 HSA-SSE.A.1 HSA-SSE.B.3 HSA.CED.A.4	9.1	8.1 & 8.2				
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12			Summative Assessment											
13	Unit 9	Electricity and Magnetism	Plan and conduct an investigation to provide evidence that an electric current can produce a magnetic field and that a changing magnetic field can produce an electric current.	HS-PS2-5	RST.11-12.1 RST.11-12.7	WHST.9-12.2 WHST.9-12.7 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3 HSA-SSE.A.1 HSA-SSE.B.3 HSA-CED.A.1 HSA-CED.A.2 HSA-CED.A.4 HSF-IF.C.7 HSS-ID.A.1	9.1	8.1 & 8.2				
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15			Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.* [Clarification Statement: Emphasis is on the attractive and repulsive forces that determine the functioning of the material. Examples could include why electrically conductive materials are often made of metal, flexible but durable materials are made up of long chained molecules, and pharmaceuticals are designed to interact with specific receptors.]	HS-PS2-6										
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17			Develop and use a model of two objects interacting through electric or magnetic fields to illustrate the forces between objects and the changes in energy of the objects due to the interaction. [Clarification Statement: Examples of models could include drawings, diagrams, and texts, such as drawings of what happens when two charges of opposite polarity are near each other.]	HS-PS3-5	RST.11-12.1	WHST.9-12.1 WHST.11-12.8 WHST.9-12.9	SL.11-12.5	MP.2 MP.4 HSN-Q.A.1 HSN-Q.A.2 HSN-Q.A.3	9.1	8.1 & 8.2				
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20			Lab Report and RST											
21	Final Exams													
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